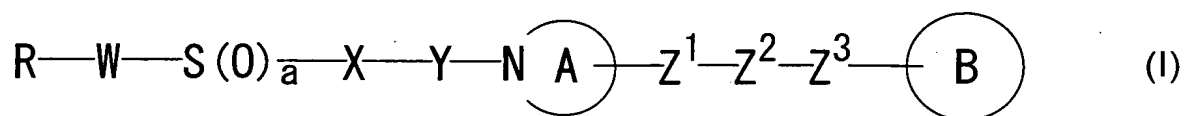


CLAIMS

1. A compound represented by the formula (I):



wherein R represents an optionally substituted cyclic

5 hydrocarbon group or an optionally substituted heterocyclic

group, W represents a bond or an optionally substituted

divalent linear hydrocarbon group, X represents an

optionally substituted divalent hydrocarbon group, Y

represents -CO-, -S(O)-, -S(O)₂- or a bond, ring A

10 represents an optionally substituted pyrrolidine ring, an

optionally substituted piperidine ring or an optionally

substituted perhydroazepine ring, Z¹ and Z³ independently

represent a bond or an optionally substituted divalent

linear hydrocarbon group, Z² represents -N(R¹)-, -O-, -

15 S(O)-, -S(O)₂-, -CO-, -CH(R¹)- or a bond (R¹ represents a

hydrogen atom, an optionally substituted hydrocarbon group,

an optionally substituted acyl group, an optionally

esterified carboxyl group or an optionally substituted

carbamoyl group), ring B represents an optionally

20 substituted imidazole ring, wherein a substituent which the

optionally substituted imidazole ring represented by ring B

may have may be taken together with R¹ to form an

optionally substituted ring, and a represents 0, 1 or 2, or

a salt thereof.

2. A prodrug of the compound according to claim 1.

3. The compound according to claim 1, wherein R is an
5 optionally substituted aryl group.

4. The compound according to claim 1, wherein R is
naphthyl optionally substituted with a halogen atom or
indolyl optionally substituted with a halogen atom.

10

5. The compound according to claim 1, wherein W is a bond.

6. The compound according to claim 1, wherein X is an
optionally substituted divalent linear hydrocarbon group.

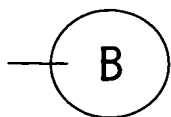
15

7. The compound according to claim 1, wherein Y is -CO-.

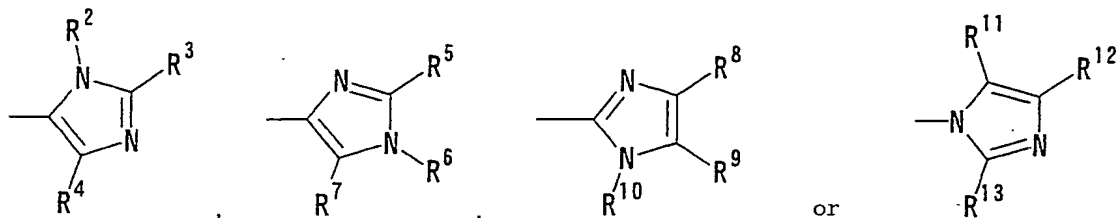
8. The compound according to claim 1, wherein ring A is
an optionally substituted piperidine ring.

20

9. The compound according to claim 1, wherein the
formula:

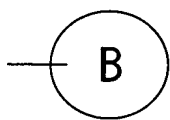


is the formula:

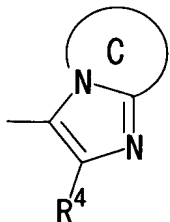


wherein R^2 , R^3 , R^4 , R^5 , R^6 , R^7 , R^8 , R^9 , R^{10} , R^{11} , R^{12} and R^{13} independently represent a hydrogen atom, an optionally substituted hydrocarbon group, an optionally substituted hydroxyl group, an optionally substituted thiol group, an optionally substituted alkylsulfinyl group, an optionally substituted alkylsulfonyl group, an optionally substituted acyl group, an optionally esterified carboxyl group, an optionally substituted carbamoyl group or an optionally substituted amino group, or R^2 and R^3 , R^5 and R^6 , R^6 and R^7 , R^8 and R^9 , R^9 and R^{10} , or R^{11} and R^{12} may be taken together to form an optionally substituted ring.

10. The compound according to claim 1, wherein the formula:



is the formula:



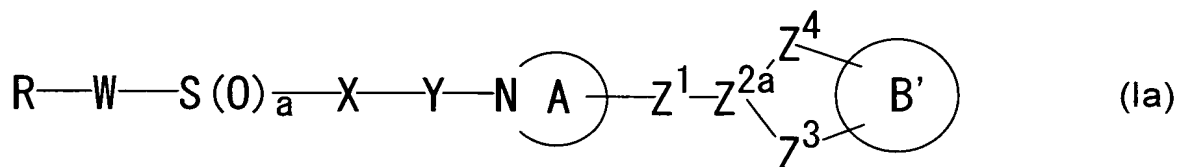
wherein ring C represents an optionally substituted nitrogen-containing heterocyclic ring, and other symbols are as defined in claim 9.

5 11. The compound according to claim 1, wherein a substituent which the optionally substituted imidazole ring represented by ring B may have and R^1 together do not form a ring.

10 12. The compound according to claim 1, wherein Z^2 is - $N(R^1)$ - or - $CH(R^1)$ - (R^1 is as defined in claim 1), and a substituent which the optionally substituted imidazole ring represented by ring B may have and R^1 are taken together to form an optionally substituted ring.

15

13. The compound according to claim 1, wherein the formula (I) is the formula (Ia):



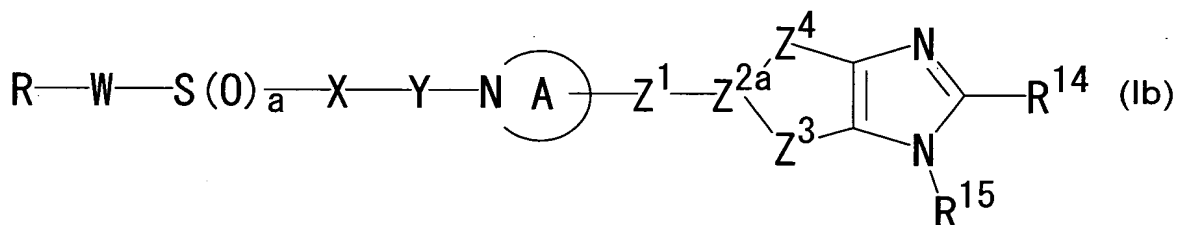
wherein ring B' represents an optionally further substituted imidazole ring, Z^{2a} represents N or CH, Z^4 represents an optionally substituted divalent linear hydrocarbon group, and other symbols are as defined in claim 1.

20

14. The compound according to claim 13, wherein Z^{2a} is a nitrogen atom.

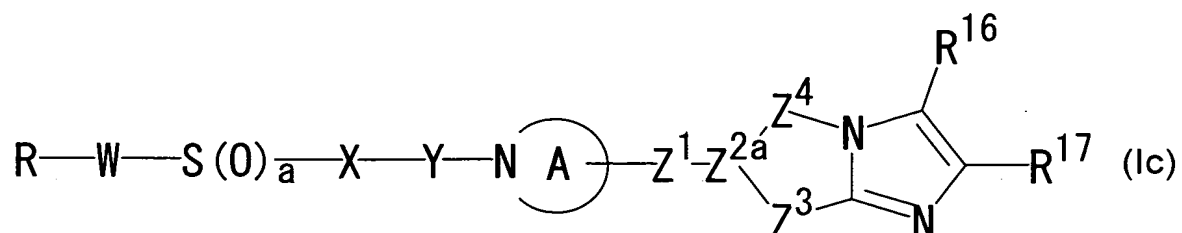
5 15. The compound according to claim 13, wherein Z^3 and Z^4 are independently a divalent linear hydrocarbon group optionally substituted with an oxo group.

16. The compound according to claim 1, wherein the formula
10 (I) is the formula (Ib):



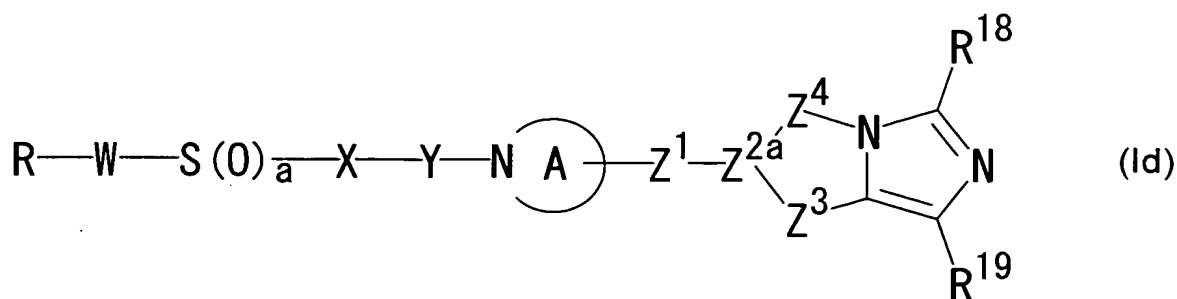
wherein R^{14} and R^{15} independently represent a hydrogen atom, an optionally substituted hydrocarbon group, an optionally substituted hydroxyl group, an optionally substituted thiol
15 group, an optionally substituted alkylsulfinyl group, an optionally substituted alkylsulfonyl group, an optionally substituted acyl group, an optionally esterified carboxyl group, an optionally substituted carbamoyl group, or an optionally substituted amino group, or R^{14} and R^{15} may be
20 taken together to form an optionally substituted ring, and other symbols are as defined in claim 1 or 13.

17. The compound according to claim 1, wherein the formula (I) is the formula (Ic):



wherein R^{16} and R^{17} independently represent a hydrogen atom,
 5 an optionally substituted hydrocarbon group, an optionally substituted hydroxyl group, an optionally substituted thiol group, an optionally substituted alkylsulfinyl group, an optionally substituted alkylsulfonyl group, an optionally substituted acyl group, an optionally esterified carboxyl
 10 group, an optionally substituted carbamoyl group or an optionally substituted amino group, or R^{16} and R^{17} may be taken together to form an optionally substituted ring, and other symbols are as defined in claim 1 or 13.

18. The compound according to claim 1, wherein the formula (I) is the formula (Id):



wherein R^{18} and R^{19} independently represent a hydrogen atom,

an optionally substituted hydrocarbon group, an optionally substituted hydroxyl group, an optionally substituted thiol group, an optionally substituted alkylsulfinyl group, an optionally substituted alkylsulfonyl group, an optionally substituted acyl group, an optionally esterified carboxyl group, an optionally substituted carbamoyl group, or an optionally substituted amino group, and other symbols are as defined in claim 1 or 13.

10 19. The compound according to claim 1, wherein a is 2.

20. A compound selected from the group consisting of 7-(1-{3-[(6-chloro-2-naphthyl)sulfonyl]propanoyl}-4-piperidinyl)-3-methyl-6,7-dihydroimidazo[1,5-a]pyrazin-8(5H)-one, 7-(1-{3-[(6-chloro-2-naphthyl)sulfonyl]propanoyl}-4-piperidinyl)-1-methyl-6,7-dihydroimidazo[1,5-a]pyrazin-8(5H)-one, 2-(1-{3-[(6-chloro-2-naphthyl)sulfonyl]propanoyl}-4-piperidinyl)-5-methyl-1,2-dihydro-3H-imidazo[1,5-c]imidazol-3-one, 2-(1-{3-[(6-chloro-2-naphthyl)sulfonyl]propanoyl}-4-piperidinyl)-5,7-dimethyl-1,2-dihydro-3H-imidazo[1,5-c]imidazol-3-one, 2-(1-{3-[(7-chloro-2H-chromen-3-yl)sulfonyl]propanoyl}-4-piperidinyl)-5-methyl-1,2-dihydro-3H-imidazo[1,5-c]imidazol-3-one, 2-[1-(3-{[(E)-2-(4-chlorophenyl)vinyl]sulfonyl}propanoyl)-4-piperidinyl]-5-

15

20

25

methyl-1,2-dihydro-3H-imidazo[1,5-c]imidazol-3-one, 2-(1-
 {3-[(5-chloro-1H-indol-2-yl)sulfonyl]propanoyl}-4-
 piperidinyl)-5-methyl-1,2-dihydro-3H-imidazo[1,5-
 c]imidazol-3-one, 2-(1-{3-[(6-chloro-2-
 5 naphthyl)sulfonyl]propanoyl}-4-piperidinyl)-5-
 (hydroxymethyl)-1,2-dihydro-3H-imidazo[1,5-c]imidazol-3-one,
 2-(1-{(2S)-3-[(6-chloro-2-naphthyl)sulfonyl]-2-
 hydroxypropanoyl}-4-piperidinyl)-5-(hydroxymethyl)-1,2-
 dihydro-3H-imidazo[1,5-c]imidazol-3-one, [2-(1-{(2S)-3-[(6-
 10 chloro-2-naphthyl)sulfonyl]-2-hydroxypropanoyl}-4-
 piperidinyl)-3-oxo-2,3-dihydro-1H-imidazo[1,5-c]imidazol-5-
 yl)methyl 1-acetylpiperidine-4-carboxylate, [2-(1-{(2S)-3-
 [(6-chloro-2-naphthyl)sulfonyl]-2-hydroxypropanoyl}-4-
 piperidinyl)-3-oxo-2,3-dihydro-1H-imidazo[1,5-c]imidazol-5-
 15 yl)methyl 3-(2-oxo-1-pyrrolidinyl)propionate, [2-(1-{(2S)-
 3-[(6-chloro-2-naphthyl)sulfonyl]-2-hydroxypropanoyl}-4-
 piperidinyl)-3-oxo-2,3-dihydro-1H-imidazo[1,5-c]imidazol-5-
 yl)methyl (2-oxo-1-pyrrolidinyl)acetate, [2-(1-{(2S)-3-[(6-
 chloro-2-naphthyl)sulfonyl]-2-hydroxypropanoyl}-4-
 20 piperidinyl)-3-oxo-2,3-dihydro-1H-imidazo[1,5-c]imidazol-5-
 yl)methyl 4-(acetylamino)butanoate, and 2-(1-{(2S)-3-[(6-
 chloro-2-naphthyl)sulfonyl]-2-hydroxypropanoyl}-4-
 piperidinyl)-5,7-dimethyl-1,2-dihydro-3H-imidazo[1,5-
 c]imidazol-3-one or a salt thereof.

21. A pharmaceutical preparation which comprises the compound according to claim 1 or 2.

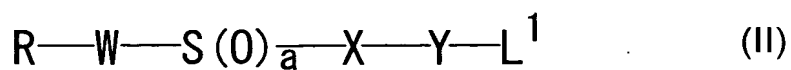
22. The pharmaceutical preparation according to claim 21,
5 which is an anticoagulant.

23. The pharmaceutical preparation according to claim 21, which is an activated blood coagulation factor X inhibitor.

10 24. The pharmaceutical preparationn according to claim 21, which is an agent for preventing or treating myocardial infarction, cerebral infarction, deep venous thrombosis, pulmonary thromboembolism or arterioscleroticobliterans.

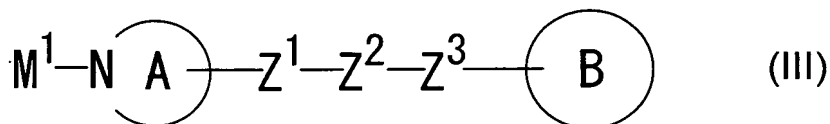
15 25. The pharmaceutical preparation according to claim 21, which is an agent for preventing or treating economy class syndrome, thromboembolism during or after an operation, or a secondary onset of deep venous thrombosis.

20 26. A process for preparing the compound according to claim 1, which comprises reacting a compound represented by the formula (II):



wherein L^1 represents a leaving group and other symbols are
25 as defined in claim 1, or a salt thereof with a compound

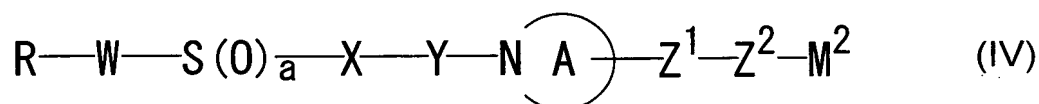
represented by the formula (III):



wherein M^1 represents a hydrogen atom, an alkaline metal, an alkaline earth metal or a leaving group, and other

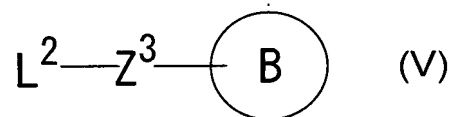
5 symbols are as defined in claim 1, or a salt thereof; or

reacting a compound represented by the formula (IV):



wherein M^2 represents a hydrogen atom, an alkaline metal, an alkaline earth metal or a leaving group, and other

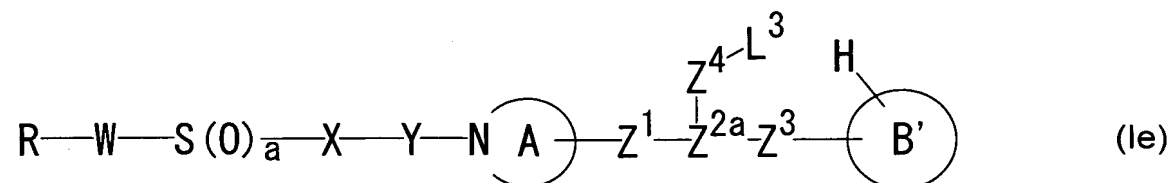
10 symbols are as defined in claim 1, or a salt thereof with a compound represented by the formula (V):



wherein L^2 represents a leaving group or a formyl group, and other symbols are as defined in claim 1, or a salt

15 thereof; or

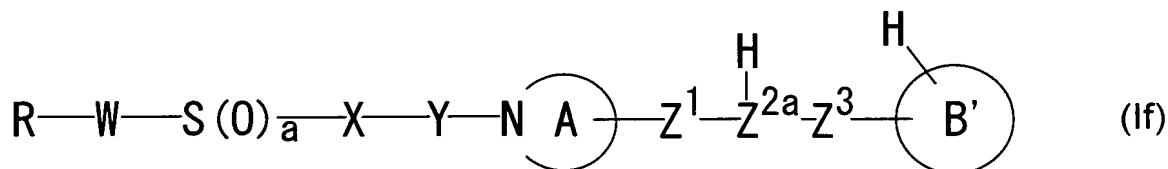
reacting a compound represented by the formula (Ie):



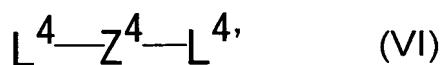
wherein L^3 represents a leaving group and other symbols are as defined in claim 1 or 13, or a salt thereof with a base;

20 or

reacting a compound represented by the formula (If):

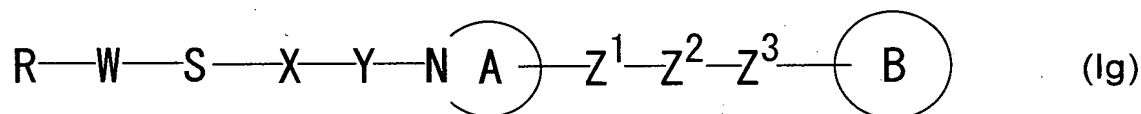


wherein symbols are as defined in claim 1 or 13, or a salt thereof with a compound represented by the formula (VI):



wherein L^4 and $\text{L}^{4'}$ represent a leaving group and other symbols are as defined in claim 13, or a salt thereof; or

oxidizing a compound represented by the formula (Ig):



wherein symbols are as defined in claim 1, or a salt thereof, and optionally subjecting a compound obtained in the above reaction to hydrolysis, esterification, amidation, alkylation, acylation, reduction, oxidation or/and deprotection reaction.

27. A method for inhibiting blood coagulation in a mammal, which comprises administering an effective amount of the compound according to claim 1 or a prodrug thereof to said mammal.

28. A method for inhibiting activated blood coagulation factor X in a mammal, which comprises administering an

effective amount of the compound according to claim 1 or a prodrug thereof to said mammal.

29. A method for preventing or treating myocardial
5 infarction, cerebral infarction, deep venous thrombosis,
pulmonary thromboembolism or arteriosclerotic obliterans in
a mammal, which comprises administering an effective amount
of the compound according to claim 1 or a prodrug thereof
to said mammal.

10

30. Use of the compound according to claim 1 or a prodrug
thereof for manufacture of a medicament for inhibiting
blood coagulation.

15

31. Use of the compound according to claim 1 or a prodrug
thereof for manufacture of a medicament for inhibiting
activated blood coagulation factor X.

20

32. Use of the compound according to claim 1 or a prodrug
thereof for manufacture a medicament for preventing or
treating myocardial infarction, cerebral infarction, deep
venous thrombosis, pulmonary thromboembolism or
arteriosclerotic obliterans.